

ATOMIC ENERGY *newsletter*®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

Dear Sir:

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Second U.S. attack-type nuclear powered submarine, Scorpion, was commissioned last week at Groton, Conn., yards of Electric Boat division of General Dynamics Corp. Skipjack, first of the group of high speed attack-type nuclear submarines now being constructed by the Navy, had been commissioned April 15, 1959. Pressurized water reactors used in both Skipjack and Scorpion had been designed and developed at Bettis atomic power laboratory, Pittsburgh, which is operated by Westinghouse Electric Co. for the USAEC. Streamlined advanced hull form and single propeller help give Scorpion extraordinary high speed and high performance, its designers point out. (Other MANUFACTURERS' NEWS, p. 2 this LETTER.)

Equipment for a complete nuclear laboratory was shipped last fortnight by Baird-Atomic, Inc., to West Pakistan. The laboratory is to be installed in Lahore in the first of two nuclear training and research centers being established by the Pakistan Atomic Energy Commission. The center will be available to the republic's graduate students and will be supplemented by a second facility to be built in Dacca, East Pakistan, at a later date. The laboratory equipment is the same as the firm sells for domestic use, although it has been modified for 220 v., 50 cycle operation. I. H. Usmani, chairman of the Pakistan AEC had examined the apparatus last April at Baird-Atomic's plant. (Other PRODUCT, PROCESS, INSTRUMENT NEWS, p. 2 this LETTER.)

First half 1960 earnings for Vitro Corp. of America were more than \$500,000 including non-recurring charge offs, according to Frank B. Jewett, Jr., president. For all of 1959 the company had reported a net loss of \$911,941 which would have been larger without using available tax credits. Mr. Jewett noted that Vitro is still negotiating a new contract with the USAEC for uranium concentrates to follow the present contract which expires in the Spring of 1962. Agreement to price and ore source has not yet been reached, he said. In the future, however, Vitro will rely less on its uranium refining work than it has to date, Mr. Jewett explained. (Other FINANCIAL NEWS, p. 3 this LETTER.)

New technical publication of the Public Health Service, "Radiological Health Data", covers in its first (July) issue results of dietary studies conducted during 1958, 1959 and 1960 at the PHS's sanitary engineering center, Cincinnati, Ohio. Included are analyses of typical meals at the Center which showed strontium-90 content ranging from an average of 1.2 micromicrocuries per meal for breakfast in January 1960 to an average of 7.7 mmc per meal for lunch in November 1959. In addition to regularly reported monthly levels of strontium-90 in milk, the quarterly issue covers concentration of short and long-lived radionuclides in milk. In the period described, the measurements of strontium-90 in milk, in micromicrocuries per litre, ranged from 3.6 for St. George, Utah, to 20.5 for St. Louis, Mo. (Other BOOKS, PUBLICATIONS, p. 4 this LETTER.)

NEW PRODUCTS, PROCESSES, INSTRUMENTS...

NEW PRODUCTS: New automatic sample changer, Model C-120, is for use with well-type scintillation detectors. It is designed to hold up to 49 test tubes containing gamma-emitting liquid or solid samples. During operation, the instrument automatically lowers the test tubes in proper sequence into the well crystal of a shielded scintillation detector for measurement; standard scalars and well detectors, found in most radioisotope laboratories, may be used. Following each sample measurement, a printing timer records the sample identity number and length of time required to reach a preset count.--Nuclear-Chicago Corp., Des Plaines, Ill.

New linear count rate meter, with wide range and low output zero drift, and said to be of high reliability, furnishes immediate indication of radiation intensity measured by proportional, scintillation, or fission counters. Designed to measure 0 to 10,000,000 cpm in ten overlapping ranges, accuracy is said to be plus-or-minus 2% of full scale on all ranges. It is one of a group of standard industrial nuclear instruments now being made by the Atomic Power Equipment Department of General Electric Co., San Jose, Calif.--General Electric Co., Apparatus Sales Div., Schenectady, N.Y.

PRODUCT NEWS: Sales increases for 1960 of from 40% to 100% over 1959 business are expected for level and density gauges by manufacturers of nuclear instruments. Selling these instruments to the industrial market are Ohmart Corp.; Instruments, Inc.; Industrial Nucleonics, Inc.; and Curtiss-Wright Corp. Market analysts point out that although the gauging devices make up only about 1% of the total \$105 million process instrument market, they are ahead of the industry as a whole which is expecting about a 10% increase in gross volume this year and about the same increase in 1961. (Some foreign business is being done; Ohmart's export business is about 20% of its volume, and that of Instruments, Inc., about 10%.)

New irradiated polyolefin tubing, trade-named Hyshrink, heat shrinks in diameter to form a tight bond even over irregular shapes. Said to be flame retardant and thermally stable, the tubing has good resistance to ionizing radiation. The manufacturer, Sequoia Wire & Cable Co., subsidiary of Anaconda Wire & Cable, claims good shelf life for the tubing.

A low enrichment superheater fuel element for nuclear power reactor use is under development by Allis-Chalmers at the company's new Greendale, Wisc. laboratory. Work now underway there involves swage compacting of uranium dioxide with stainless steel. This will be followed by a program involving draw bonding of stainless steel aimed at developing a 7-rod cluster fuel element. (Greendale has recently concluded its development of high enrichment superheater fuel elements for the nuclear power plant Allis-Chalmers is building for Northern States Power Co.)

Studies at Battelle Memorial Institute on low cost nuclear fuels have shown feasibility of simple types using oxides and carbides of uranium, thorium and plutonium. One fuel element now being investigated is a metal tube which has been filled with powdered uranium oxide and sealed. Its cheapness is result of elimination of processing normally used in present fuel element preparation, i.e., pressing, high-temperature sintering and grinding of the uranium oxide pellets before they are loaded.

Zirconium fabricators must give the nuclear industry less expensive, higher quality zirconium alloys if they want more business from the nuclear reactor field a recent seminar held at San Jose, Calif., by General Electric Co., for zirconium suppliers was told. GE people from the company's Atomic Power Equipment Department outlined requirements for zirconium alloy for use in reactors incorporating nuclear superheat as material having strength and corrosion resistance equal to or better than 304 stainless steel at 1,200 deg. F.; low hydrogen pickup at 1,200 deg. F.; and resistance to rapid failure with defects. A suitable zirconium alloy for use in boiling water reactors should have (GE people stated) corrosion resistance equal to zirconium-2; strength equal to zirconium-2 with greater ductility; low hydrogen pickup; no appreciable deterioration under irradiation; and resistance to rapid failure with defects.

A one step process to make molded graphite has been developed by Armour Research Foundation, Chicago, under a USAEC contract. Furfuryl alcohol, which hardens on heating, is used as binder for the carbon source. This produces a molding strong enough to be heated directly to the graphitization temperature of about 5,000 deg. F. without an intermediate cooling step. This is faster and cheaper than conventional methods and may enable production of less expensive graphite moderators for nuclear reactors.

ATOMIC ENERGY PATENT DIGEST...

PATENTS ISSUED July 19, 1960 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:

(1) Gas filled dosimeter and method of manufacturing it. Ole G. Landsverk, Delbert L. Merriner, inventors. No. 2,945,734 assigned to Landsverk Electrometer Co., Glendale, Calif. (2) Recovery of uranium values. Ronald E. Stedman, inventor. No. 2,945,741 assigned to Imperial Chemical Industries, Ltd., London, England. (3) Liquid-liquid extraction process for the recovery of high purity thorium oxide. Charles C. Christensen, John D. Prater, inventors. No. 2,945,742 assigned to Kennecott Copper Corp., New York, N.Y. (4) Process for increasing the hardness of flexible resinous composition sheets by irradiating them. Alfred S. Cummin, inventor. No. 2,945,795 assigned to Congoleum-Mairn, Inc., Kearney, N.J. (5) Ion source and mass spectrometer utilizing it. Glenn O. Bright, inventor. No. 2,945,951 assigned to Phillips Petroleum Co.

PATENTS ISSUED July 19, 1960 to GOVERNMENTAL ORGANIZATIONS: (1) Apparatus for detecting radioactive particle emission. Isaac A. Mossop, Philip P. Fay, Gordon Packman, inventors. No. 2,945,955 assigned to U.K. Atomic Energy Authority, London, England. (2) Voltage measuring circuits. Michael O. Deighton, inventor. No. 2,946,013 assigned to U.K. Atomic Energy Authority, London, England. (3) Process for jacketing a core. George A. Last, inventor. No. 2,945,293 assigned to USAEC. (4) Ruthenium decontamination method. Alan T. Gresky, inventor. No. 2,945,740 assigned to USAEC. (5) Neutronic reactor operational method and core system. Charles E. Winters, Clifton B. Graham, Joseph S. Culver, Robert H. Wilson, inventors. No. 2,945,794 assigned to USAEC. (6) Process for coloring diamonds. Ronald A. Dugdale, inventor. No. 2,945,793 assigned to USAEC. (7) Ion source. Clarence W. Blue, John S. Luce, inventors. No. 2,945,972 assigned to USAEC.

PATENTS ISSUED July 26, 1960 to PRIVATE ORGANIZATIONS AND/OR INDIVIDUALS:

(1) Nuclear power plant. William R. Wootton, inventor. No. 2,946,732 assigned to Babcock & Wilcox, Ltd., London, England. (2) Nuclear measuring system. Serge A. Scherbatskoy, inventor. No. 2,946,888 issued to inventor of record. (3) Focusing system for use in radioactivity well logging. Nils L. Muench, inventor. No. 2,946,889 assigned to Jersey Production Research Co., Tulsa, Okla. (4) Film holder for monitoring radiation. Arthur M. Samples, inventor. No. 2,946,890 issued to inventor of record. (5) Test apparatus and method. Edmund Wesolowski, inventor. No. 2,946,891 assigned to The Pure Oil Co., Chicago, Ill.

PATENTS ISSUED July 26, 1960 to GOVERNMENTAL ORGANIZATIONS: (1) Process of impregnating graphite with a uranium compound. Manuel C. Sanz, Robert P. Randolph, Chauncey Starr, inventors. No. 2,946,699 assigned to USAEC. (2) Apparatus for producing and manipulating plasmas. Stirling A. Colgate, John P. Ferguson, Harold P. Furth, Robert E. Wright, inventors. No. 2,946,914 assigned to USAEC.

ATOMIC ENERGY BUSINESS & FINANCIAL NEWS...

SUPREME COURT APPEAL IN NUCLEAR POWER PLANT CASE: Efforts will be made by the USAEC to have the United States Supreme Court review decision of the Appeals Court of District of Columbia which set aside provisional construction permit issued by the USAEC to Power Reactor Development Co. Following the initial Appeals Court ruling, the Commission had asked for a review of its findings, but the Appeals Court had refused. The Court had said last month that the USAEC, in granting a construction permit in 1956 for the 96 mw Enrico Fermi fast breeder reactor plant being built by Power Reactor Development Co., had not made sufficient safety findings for future reactor operation. Construction work has been going on for the past four years, and the turbine generator facility was due to be completed late this Summer. Power Reactor Development Co. is a Michigan corporation made up of 13 public utilities, 7 equipment manufacturers, and led by Detroit Edison Co.

INSTRUMENT MAKER HAS PROFITABLE FIRST HALF: First half 1960 profit of \$55,000 by Tracerlab, Inc., Waltham, Mass. manufacturer of nuclear instruments, was on sales of \$6,079,000 and was the best six months the company had since 1953. The profit was after completely writing off the continued expense of a high level advanced development program. Sales backlog is now \$1 million higher than at this time last year, the company points out, while the first half 1960 gross business was about 20% better than for the like 1959 period.

NEW BOOKS & OTHER PUBLICATIONS:

Beryllium. Monograph 7, Metallurgy of the Rarer Metals. G. E. Darwin, H. H. Buddery. Latest monograph in this series. 392 pages.--Academic Press, Inc., 111 Fifth Ave., New York 3. (\$13.50)

Nuclear Energy Terms; A Bilingual Glossary. Part I, English to German; Part II, German to English. Compact listing of more than 1,200 terms frequently used in the nuclear field. 125 pages.--Nuclear Translation Services, 516 E. 79th St., New York 21. (\$3.00)

The Restless Atom. Alfred Romer. Simplified account of nuclear work. 195 pages.--Doubleday & Co., Inc., Garden City, N.Y. (95¢)

No High Ground. Fletcher Knebel, Charles W. Bailey. An account of the early development of the atomic bomb and its first use. 272 pages.--Harper & Bros, New York 14. (\$4)

The Market for Nuclear Equipment and Instrumentation. Part 4 of the Stresa Conference, held May 11-14, 1959. 272 pages.--O.E.E.C. Mission, 1346 Conn. Ave., N.W., Wash. 6, D.C. (\$3)

Methods of Calculating U-235 Outputs & Charges By Use of Ideal Cascade Theory. No. TID-8522. (50¢).....Radioisotopes in Industry; Training Program. J. P. Danforth, R. P. Stapp. Two volumes, originally developed by General Motors Corp. for its isotope laboratory. 1,500 pages. (\$10 for 2 volumes).....Fast Breeder Reactor Program. No. TID-8523. (50¢).....Materials Research in the Navy. Vol. 1, No. PB-161470; Vol. 2, No. PB-161471. (\$6 and \$5 respectively.) -- Office of Technical Services, Wash. 25, D.C.

Neutron Dosimetry Research. W. S. Diethorn, E. Paskell, et al. Work at Battelle Memorial Institute. No. PB 145,939 (Microfilm, \$3.30; photostat, \$7.80).....Literature Survey on Effects of Nuclear Radiation to Electron Tube Materials. E. R. Johnson. Investigations at Stevens Institute of Technology, Hoboken, N.J. (Microfilm \$2.40; photostat, \$3.30) -- Library of Congress, Wash. 25, D.C.

Fact Book on U. S. Nuclear Power Projects. Covers projects of U. S. electric utilities. 48 pages. Complete revision of fact sheets first published December, 1958.--Electric Companies Public Information Program, 2 W. 45th St., New York 36. (\$2.50)

Radioactivity for Pharmaceutical and Allied Research Laboratories. Abraham Edelmann, editor. Proceedings of symposium sponsored by Nuclear Science & Engineering Corp. 171 pages. -- Academic Press, Inc., 111 Fifth Ave., New York 3. (\$6.00)

Status Report on Fast Reactors as of 1959. Part of the USAEC's study of the U. S. civilian power reactor program. 99 pages.--Superintendent of Documents, Wash. 25, D.C. (\$1.00)

NOTES: Annual report for year ending March 31, 1960 of Atomic Energy of Canada, Ltd., may be obtained as publication CCL-1960 at 25¢ from AECL, P.O. Box 711, Ottawa, Canada.

Articles published, papers presented, and reports issued by staff members of Oak Ridge National Laboratory during 1959 are in 84 page compilation number ORNL 60-6-49 available from the Laboratory at Oak Ridge, Tenn., on request.

New edition of "Catalog of Courses on Nuclear Energy in O.E.E.C. Countries" has been issued by that agency and may be obtained on request to O.E.E.C., 38 Boulevard Suchet, Paris, France.

List No. 55 of the U.K. Atomic Energy Authority is latest group of original documents and translations issued by the Authority and compiled by the library of the Atomic Energy Research Establishment, Harwell, England, from whom it may be obtained at no charge.

Hearings held April 12-22 by Joint Congressional Committee on Atomic Energy on technical aspects of detection and inspection controls of a nuclear test ban have been published in two parts by the Committee. The material may be obtained on request to the JCAE, Washington 25, D.C.

MANUFACTURERS' LITERATURE: Four page brochure on its automatic sample changer for very low level solid beta emitting radioactive samples is available from Nuclear-Chicago Corp., Des Plaines, Ill.....High voltage power supplies for primary nuclear detectors are described in bulletin GEA-7099 available from General Electric Co. Apparatus Sales Div., Schenectady, N.Y.....Radioactive compound price list of July, 1960, available from New England Nuclear Corp., Boston 18, Mass., lists 69 new carbon-14, 17 new tritium and 16 new short lived isotope labeled compounds in addition to 275 other tagged compounds.

ATOMIC ENERGY CONTRACT NEWS...

EURATOM PROPOSALS: The U.S.-EURATOM Joint Research & Development Board, Brussels, has accepted for contract negotiations some 22 additional research and development proposals from Community and U.S. groups. Last December, the Board had authorized 23 contracts valued at \$3,500,000 covering research and development proposals submitted by 14 Community and 8 U.S. groups. The new contracts will bring the dollar-value of accepted proposals to \$7,800,000 and increase Community participants to 28 and those of the U.S. to 10. Acceptance of the proposals marked completion of the Board's review of some 300 received through April, 1960, in response to its invitation of December, 1958. The interest of the Board has been in work related to the boiling water reactor concept and towards plutonium recycling. Emphasis has been on work in the areas of plutonium and uranium compounds, fuel development, improved zirconium alloys and heat transfer studies. (Additional proposals are to be invited shortly, in other fields of interest.) U.S. groups making acceptable proposals included Armour Research Foundation; Radiation Applications, Inc.; General Electric Co.; North Carolina State College; American Standard Corp.; Battelle Memorial Institute; Babcock & Wilcox Co. (in association with Groupement pour l'Industrie Atomique); Nuclear Development Corp. of America (in association with Centro Informazioni Studi Esperienze); Westinghouse Electric Co. (in association with Fiat group); and Westinghouse Electric Co. (in association with Metallurgie et Mecanique Nucleaires.)

ALTITUDE SENSING DEVICES: Research and development on a nuclear altimeter by Tracerlab, Inc., Waltham Mass., will be continued under contract the firm has received from Picatinny Arsenal, Dover, N.J. The altimeter will utilize beta back-scatter to sense atmospheric density at varying heights above the earth's surface. Since atmospheric density is related to height, the instrument will give direct indications of altitude.

NUCLEAR POWER STATION: Letter of intent has been given by the U.K. Central Electricity Generating Board to Britain's Nuclear Power Consortium for construction of a 550 mw nuclear power station at Dungeness. Made up of AEL-John Thompson Nuclear Energy Co. and the Nuclear Power Plant Co., the consortium will handle all aspects of the \$150 million job. Four turbine-generator sets will be driven by two reactors of advanced Calder Hall type at the new station.

CANADIAN URANIUM PRICE LOWEST: Some 6½-tons of uranium concentrates will be bought by Japan from Canada at a price of \$4.90 per lb., lowest quotation made by 17 bidders from Canada and other countries. The successful bid was made by Marubeni-Iida Co., Ltd., on behalf of the government-owned company Eldorado Mining & Refining, Ltd. Other bids were from Government and private firms; lowest price quoted by a U.S. concentrates supplier was approximately \$5.70 per pound. Japan has previously bought uranium concentrates from Australia, Canada, South Africa, and the U.S.

FRENCH NUCLEAR POWER PLANT: Westinghouse Electric Corp. and two European companies with which it is associated have received contract award for a 242,000 kw nuclear power plant from Societe d'Energie Nucleaire Franco-Belge des Ardennes (SENA), a group of French and Belgian utilities. It will be erected at Chooz, France, near the Belgian border. The plant will use a closed-cycle pressurized water reactor of Westinghouse design. Equipment will be manufactured by Westinghouse; Ateliers des Constructions Electriques de Charleroi, Belgium; Framatome, a French group; and a number of their affiliated companies. Gibbs and Hill, New York, have been retained as architect-engineers. Scheduled for operation in 1965, the SENAI station will be the largest single-reactor plant in Europe using enriched uranium as fuel. (Westinghouse is also supplying the nuclear equipment for the 165,000 kw SELNI plant in northern Italy, and for the 11,500 kw unit of Centre d'Etude de l'Energie Nucleaire, Mol, Belgium.)

FUEL ELEMENT FABRICATION: Fuel elements of enriched uranium-beryllium oxide will be fabricated by Coors Porcelain Co., Golden, Colo, under new contract received by the firm from University of California's Radiation Laboratory. Intended use for the fuel elements is a test reactor of Project Pluto for determining feasibility of nuclear ramjet propulsion. Reactor design work was done at Livermore Laboratories, part of the Radiation Laboratory.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

August 2, 1960